

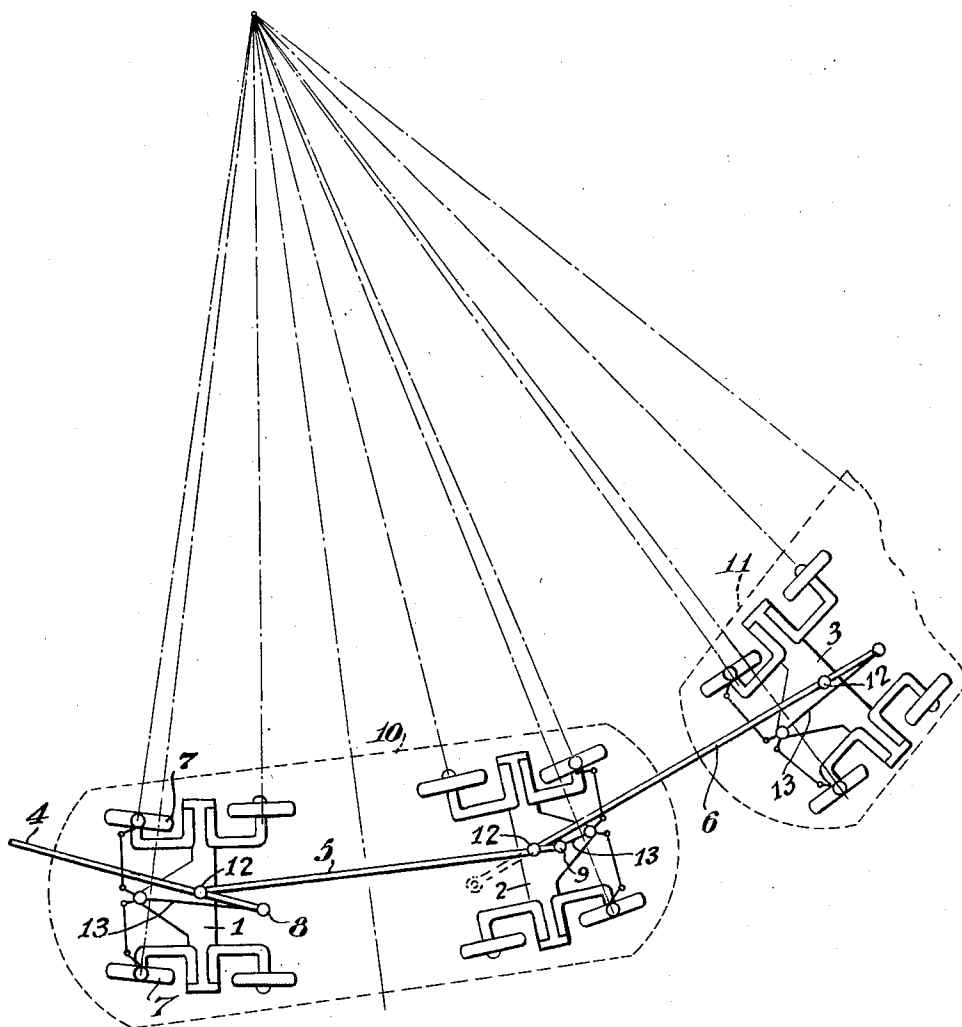
Sept. 13, 1932.

H. W. JONKHOFF

1,876,684

AUTOMATIC STEERING DEVICE FOR SWIVELING BOGIES

Filed June 27, 1929



INVENTOR
H. W. JONKHOFF

By D. P. Welch Att'y

UNITED STATES PATENT OFFICE

HENRI WOUTER JONKHOFF, OF BECKENHAM, ENGLAND

AUTOMATIC STEERING DEVICE FOR SWIVELING BOGIES

Application filed June 27, 1929, Serial No. 374,168, and in the Netherlands July 4, 1928.

This invention relates to an automatic steering device for swiveling bogies supporting the ends of a platform, two of said bogies being connected by means of a lever, which
5 has a pivotal connection on each of the longitudinal axes of said bogies.

Said lever carries a steering transmission which connects the lever to the steering mechanism of the bogie wheels and the swiveling
10 movement of the lever over the bogie, which takes place in rounding a curve, brings the steering mechanism of the bogie in action, so that by means of the invention, a simple and efficient automatic steering of the bogie
15 wheels can be effected.

It is known already that bogie wheels can be steered automatically by using the swiveling movement of the platform, which takes
20 place on curves, to direct the steering mechanism of the bogie wheels. Instead of the platform another connection like a bar or rod between two bogies will do just as well and such another connection can even be installed parallel and fixed relatively to the platform.
25

Such a lever must have a pivotal connection on each of the two connected 4-wheeled bogies and those pivots have to be placed on the longitudinal axes of the bogies and according to the invention the king pin, connecting the bogie to the platform, serves as
30 well as the pivot for the lever.

Said lever furthermore can have an extension behind the pivot connection in order to turn the movement oppositely with regard to the bogie-chassis as, in this case, the controlling point carried by the lever is moved into an opposite direction with regard to the steered wheels when carried on the extension of the lever. It is therefore clear that
35 in order to make reversing possible, a mechanism has to be introduced for the purpose of moving the controlling point or the transmission carried by the lever to the other side of the lever pivot. Such a mechanism can be avoided, however, if, by means of one controlling point carried on the lever connecting two bogies, the steering mechanism of the two pairs of wheels is directed, the first pair
40 of wheels being the rear wheels of the lead-

ing bogie, and the second pair being the front wheels of the following bogie.

In such an arrangement the transmission on the lever is effected by the sum of the swiveling movements of two bogies relative
55 to the longitudinal axis of the connecting lever, so long as the two adjoining bogie parts move out at the same side of the connecting lever. Whilst the amount of swiveling for each bogie part with regard to the lever can be different, there is a possibility that, for instance, in a contra curve, the rear end of the front bogie swivels out to one side of the connecting lever whilst the front end of the second bogie swivels out to
60 the other side of the lever, and in such a case the steering transmission, of course, is not affected by the sum but by the difference between the two amounts of swiveling movement of the two bogies.
65

The drawing illustrates an application of the invention, showing in plan three bogie-chassis 1, 2 and 3, pivotally connected together at their centres by means of the levers
70 4, 5 and 6.

In the drawing, each bogie is pivotally connected to a platform 10 and 11 so that each bogie supports an end of a platform.

In the drawing, 10 designates a car or platform which is supported by a pair of bogies, designated as 1 and 2, which are pivoted to the platform, as at 12, near the ends thereof, respectively. In this connection it is to be understood that other cars or platforms having bogies identical with the bogies 1 and 2
80 are adapted to be coupled in a train as indicated in the drawing, wherein 11 designates a portion of a second car or platform coupled to the car 10.
85

Each bogie comprises front and rear pairs of wheels, of which the inner pair always remain parallel to the longitudinal axis of the bogie and the front pair are mounted for angular steering movements relative to the bogie.
90

The direction of movement of the cars may be assumed for purposes of the present description to be to the right as viewed in the drawing. Thus it will be observed that from the pivot 12 of the rear bogie of each plat-
95 100

form a rod 5 extends forwardly and is connected with the pivot 12 of the front bogie, whereby said rod remains to all intents and purposes fixed with respect to the platform. Said rod extends forwardly beyond the pivot 12 of the front bogie and at a suitable distance in front of said pivot 12 is pivotally connected as at 9 with the rear arm of a lever 13 which is pivoted intermediately and has its front arm divided and suitably connected by links with the front steering wheels of the front bogie whereby pivoting of the bogie relative to the platform produces angular steering movements of the front wheels of the front bogie.

From the pivot 12 of the front bogie of each car or platform a lever extends forwardly and is pivoted on the pivot 12 of the rear bogie of the next forward car or platform. In the drawing 4 designates such a lever extending from the car or platform from the car behind the car or platform 10 and 6 designates a corresponding lever extending forwardly from the front bogie of the car or platform 10 and pivoted to the pivot 12 of the rear bogie of the car or platform next in advance of the car or platform 10. Each of said levers extends forwardly of the pivot 12 of the rear bogie of the related car and is pivoted, as at 8, to the front end of an intermediately pivoted steering lever 13 for the rear pair of wheels of the rear bogie, the rear end of said lever 13 being divided and connected by suitable links with the rear steering wheels of the rear bogie whereby pivoting of the lever 4 or 6 about the pivot 12 of the rear bogie effects angular steering movements of the rear wheels of the rear bogie. Such pivoting of the levers 4, 6, obviously is effected by the change in direction of the cars or platform in rounding a curve. Thus, due to change in direction of the cars or platforms, steering movements of the rear wheels of the rear bogies are effected.

I claim:—

1. Automatic steering mechanism of the character described comprising a vehicle body element, a bogie pivoted to the front end of said body element for pivotal movement relative thereto, front and rear pairs of wheels carried by said bogie, the front pair of said wheels being mounted for angular steering movements relative to the bogie, a lever pivoted coaxially with the pivotal connection of the bogie with the vehicle body element, and a connection between said lever and the angularly movable steering wheels of the bogie whereby pivotal movements of the lever relative to the bogie effect angular steering movements of the steering wheels, the said lever extending from the vehicle for connection with another vehicle whereby pivotal movements are adapted to be imparted to the

lever relative to the vehicles by the movements of the vehicles in rounding curves.

2. Automatic steering mechanism of the character described comprising a vehicle body element, a bogie pivoted to said body element for pivotal movement relative thereto, front and rear pairs of wheels carried by said bogie, one pair of said wheels being mounted for angular steering movements relative to the bogie, the other pair of said wheels being mounted to remain at all times parallel to the longitudinal axis of the bogie, a lever pivoted at one point coaxially with the pivotal connection of the bogie with the vehicle body element and adapted to be pivoted at another point coaxially with the pivotal connection of a bogie of another vehicle with its related body element, and a link pivoted at one point to said lever at a point on the latter spaced from its first mentioned pivot and connected at another point with the angularly movable steering wheels of the bogie to effect steering movements of the latter.

3. Automatic steering mechanism of the character described comprising a vehicle body element, a bogie pivoted to said body element for pivotal movement relative thereto, front and rear pairs of wheels carried by said bogie, the rear pair of said wheels being mounted for angular steering movements relative to the bogie, the front pair of said wheels being mounted to remain at all times parallel to the longitudinal axis of the bogie, a lever pivoted on the bogie and having a fixed relation to the vehicle body element, and a member pivoted to said lever at a point on the latter spaced from its first mentioned pivot and connected with the angularly movable steering wheels of the bogie to effect steering movements of the latter.

In testimony whereof I have affixed my signature hereto this 18th day of June 1929.

HENRI WOUTER JONKHOFF.